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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,215	04/02/2004	Xiang Zhu	M-15339 US	2417

7590

01/11/2006

Jon W. Hallman  
MacPHERSON KWOK CHEN & HEID LLP  
Suite 226  
1762 Technology Drive  
San Jose, CA 95110

EXAMINER
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TRA, ANH QUAN

ART UNIT	PAPER NUMBER
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2816

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

31

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/817,215	ZHU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Quan Tra	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9, 11 and 14-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/9/04</u> | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This office action is in response to the amendment filed 11/25/05. A new ground of rejection is introduced as necessitated by amendment.

#### ***Drawings***

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al. (USP 6275097) (newly cited) in view of Abidin et al. (USP 6686794) (previously cited).

As to claim 1, Liang et al.'s figure 4 shows a differential charge pump circuit, Liang et al.'s figure 4 fails to show the detail of the common mode feedback circuit 75. However, Abidin et al.'s figure 5 shows common mode feedback circuit for stabilizing the outputs of charge pump

circuit. Therefore, it would have been obvious to one having ordinary skill in the art to use Abidin et al.'s common mod feedback circuit for Liang et al.'s common mode feedback circuit (75) for the purpose of further stabilizing the outputs of the charge pump. Thus, the modified Liang et al.'s show a differential charge pump comprising: a current switch (51, 53, 94, 92, 61, 63) responsive to a pulse width difference between a differential up voltage (UP, UB) and a differential down voltage (DN, DB) to source and sink a current in a complementary fashion from a pair of differential output nodes (OP, ON), wherein the differential output nodes are voltage isolated from the current switch; a first transconductance amplifier (Abidin's 41 in figure 4) configured to convert a voltage at a first one of the differential output nodes into a first current; and a second transconductance amplifier (Abidin's 42 in figure 5) configured to convert a voltage a second one of the differential output nodes into a second current that is complementary to the first current.

As to claim 2, Abidin's figure 5 shows a resistive load (43, 44) coupled between a first node and a second node, wherein the first transconductance amplifier is configured to couple the first current to the first node, and the second transconductance amplifier is configured to couple the second current to the second node.

As to claim 3, the modified Liang et al.'s figure 4 shows a common-mode feedback circuit (Abidin's 46 in figure 5 and Liang et al.'s 83, 85, 87, 89) configured to maintain a common-mode voltage on the resistive load equal to a common-mode reference voltage (CMFB).

As to claim 4, Abidin's figure 5 shows that the first and second transconductance amplifiers are operational transconductance amplifiers.

As to claim 5, Ling et al.'s figure 4 shows that the current switch comprises: a first differential pair of transistors (51, 94) biased by a first current source (53) to conduct the current, the transistors in the first differential pair being responsive to the differential up voltage such that when the differential up voltage is pulsed the current is conducted by a first transistor in the first differential pair and when the differential up voltage is not pulsed the current is conducted by a remaining second transistor in the first differential pair; and a second differential pair (92, 61) of transistors biased by a second current source (63) to conduct the current such when the differential down voltage is pulsed the current is conducted by a first transistor in the second differential pair and when the differential up voltage is not pulsed the current is conducted by a remaining second transistor in the second differential pair.

Claims 14 and 15 recite similar limitations of claims above. Therefore, they are rejected for the same reasons.

3. Claims 8, 9, 11 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's prior art figure 1 in view of Liang et al. (USP 6275097) and Abidin et al. (USP 6686794).

The prior art figure 1 shows all limitations of the claims except for the detail of charge pump circuit 160. However, the modified Liang et al.'s figure 4 shows a differential charge pump circuit that capable of operating in high speed. Therefore, it would have been obvious to one having ordinary skill in the art to use the modified Liang et al.'s charge pump for the charge pump in prior art figure 1 for the purpose of improving the operation speed of the circuit.

*Allowable Subject Matter*

4. Claims 6, 7, 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 6, 7, 12 and 13 would be allowable because the prior art fails to teach or suggest that the first transistor in the first differential pair and the second transistor in the second differential pair couples to the first node through a first pair of resistors, and the second transistor in the first differential pair and the first transistor in the second differential couples to the second node through a second pair of resistors.

*Conclusion*

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2816

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan Tra whose telephone number is 571-272-1755. The examiner can normally be reached on 8:00 A.M.-5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Quan Tra', with a long horizontal flourish extending to the right.

QUAN TRA  
PRIMARY EXAMINER  
ART UNIT 2816

January 3, 2006